CLAIMS

WE CLAIM:

1. An isolated nucleic acid comprising a polynucleotide selected from the group consisting of (1) a first nucleotide sequence that encodes a polypeptide selected from the group consisting of amino acid 22 to amino acid 439 of SEQ ID NO:2, amino acid 22 to amino acid 400 of SEQ ID NO:4, a sequence that is at least about 68% identical to amino acid 22 to amino acid 439 of SEQ ID NO:2, and a sequence that is at least about 68% identical to amino acid 22 to amino acid 400 of SEQ ID NO:4, (2) a second nucleotide sequence that is at least 80% identical to the first nucleotide sequence, and (3) a complement of the first or second nucleotide sequence.

2. The isolated nucleic acid of claim 1, wherein the nucleic acid consists of a polynucleotide selected from the group consisting of (1) a first nucleotide sequence that encodes a polypeptide selected from the group consisting of amino acid 22 to amino acid 439 of SEQ ID NO:2, amino acid 22 to amino acid 400 of SEQ ID NO:4, a sequence that is at least about 68% identical to amino acid 22 to amino acid 439 of SEQ ID NO:2, and a sequence that is at least about 68% identical to amino acid 22 to amino acid 400 of SEQ ID NO:4, (2) a second nucleotide sequence that is at least 80% identical to the first nucleotide sequence, and (3) a complement of the first or second nucleotide sequence.

3. The isolated nucleic acid of claim 1, wherein the nucleic acid comprises a polynucleotide selected from the group consisting of nucleotide 88 to nucleotide 1341 of SEQ ID NO:1, nucleotide 64 to nucleotide 1200 of SEQ ID NO:3, and a complement of any of the foregoing.

4. A genetic construct comprising a polynucleotide of claim 1 operably linked a heterologous transcriptional promoter.

5. A host cell comprising the genetic construct of claim 4.

6. The isolated nucleic acid of claim 1, wherein the nucleic acid comprises a polynucleotide selected from the group consisting of (1) a first nucleotide sequence that encodes a polypeptide selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, a sequence

that is at least about 70% identical to SEQ ID NO:2, and a sequence that is at least about 70% identical to SEQ ID NO:4, (2) a second nucleotide sequence that is at least 80% identical to the first nucleotide sequence, and (3) a complement of the first or second nucleotide sequence.

7. The isolated nucleic acid of claim 6, wherein the nucleic acid consists of a polynucleotide selected from the group consisting of (1) a first nucleotide sequence that encodes a polypeptide selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, a sequence that is at least 70% identical to SEQ ID NO:2, and a sequence that is at least 70% identical to SEQ ID NO:4, (2) a second nucleotide sequence that is at least 80% identical to the first nucleotide sequence, and (3) a complement of the first or second nucleotide sequence.

8. The isolated nucleic acid of claim 6, wherein the nucleic acid comprises a polynucleotide selected from the group consisting of nucleotide 25 to nucleotide 1341 of SEQ ID NO:1, nucleotide 1 to nucleotide 1200 of SEQ ID NO:3, and a complement of any of the foregoing.

9. A genetic construct comprising a polynucleotide of claim 6 operably linked a heterologous transcriptional promoter.

10. A host cell comprising the genetic construct of claim 9.

11. An isolated polypeptide comprising an amino acid sequence encoded by the first nucleotide sequence in claim 1.

12. An isolated polypeptide consisting of an amino acid sequence encoded by the first nucleotide sequence in claim 1.

13. The isolated polypeptide of claim 11, wherein the polypeptide comprises an amino acid sequence selected from the group consisting of amino acid 22 to amino acid 439 of SEQ ID NO:2 and amino acid 22 to amino acid 400 of SEQ ID NO:4.

14. An isolated polypeptide comprising an amino acid sequence encoded by the first nucleotide sequence in claim 6.

15. An isolated polypeptide consisting of an amino acid sequence encoded by the first nucleotide sequence in claim 6.

16. The isolated polypeptide of claim 14, wherein the polypeptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO:2 and SEQ ID NO:4.

17. An antibody that specifically binds to a polypeptide consisting of an amino acid sequence encoded by the first nucleotide sequence in claim 1.

18. An antibody that specifically binds to a polypeptide consisting of an amino acid sequence encoded by the first nucleotide sequence in claim 6.

19. A method for identifying an agent that can modulate the expression of a polynucleotide of claim 1, the method comprising the steps of:

exposing a cell that comprises a polynucleotide of claim 1 under the control of its native promoter;

measuring the expression of the polynucleotide in the cell; and

comparing the expression to that in a control cell that is not exposed to the test agent, wherein a higher or lower than the expression in the control cell indicates that the agent can modulate the expression of the polynucleotide.

20. The method of claim 19, wherein the cell that comprises a polynucleotide of claim 1 under the control of its native promoter is a cell selected from the group consisting of a liver cell, a breast cell, a kidney cell and a colon cell.

21. The method of claim 19, wherein the expression is measured at the mRNA level.

22. The method of claim 19, wherein the expression is measured at the protein level.

23. A method for diagnosing a cancer or preneoplastic development in a tissue or organ of a human or non-human animal, the method comprising the steps of:

measuring the expression of a polynucleotide of claim 1 in cells of the tissue or organ obtained from a region suspected of cancer or preneoplastic development; and

comparing the expression of the polynucleotide to a normal standard wherein a higher than normal expression indicates cancer or preneoplastic development in the tissue or organ in the suspect region.

24. The method of claim 23, wherein the tissue or organ is selected from the group consisting of liver, breast, colon and kidney.

25. The method of claim 24, wherein the tissue or organ is liver.

26. A method as claimed in claim 23 wherein the expression of the polynucleotide of claim 1 is measured at the mRNA level.

27. A method as claimed in claim 23 wherein the expression of the polynucleotide of claim 1 is measured at the protein level.

28. A method for identifying a human or non-human animal as a candidate for further screening for cancer or preneoplastic development in a tissue or organ, the method comprising the steps of:

determining the level of a polypeptide of claim 11 in a blood or blood-derived sample from the animal;

comparing the level to a normal range established by the same animal during a period that is tumor-free in the tissue or organ, or by a plurality of animals of the same species that are tumor-free in the tissue or organ; and

identifying the animal as a candidate for further cancer screening when the level exceeds the established normal range.

29. The method of claim 28, wherein the tissue or organ is selected from the group consisting of liver, breast, colon and kidney.

30. The method of claim 29, wherein the tissue or organ is liver.

31. A method for identifying a human or non-human animal as a candidate for further screening for cancer or preneoplastic development in a tissue or organ, the method comprising the steps of:

determining the level of an antibody to a polypeptide of claim 11 in a blood or blood-derived sample from the animal;

comparing the level to a normal range established by the same animal during a period that is tumor-free in the tissue or organ, or by a plurality of animals of the same species that are tumor-free in the tissue or organ; and

identifying the animal as a candidate for further cancer screening when the level exceeds the established normal range.

32. The method of claim 31, wherein the tissue or organ is selected from the group consisting of liver, breast, colon and kidney.

33. The method of claim 32, wherein the tissue or organ is liver.

34. A kit comprising:

at least one of an antibody that specifically binds to a polypeptide consisting of an amino acid sequence encoded by the first nucleotide sequence in claim 1, and a probe that hybridizes to the polynucleotide in claim 1; and

at least one control sample component for which the relative or absolute amount of the polypeptide or polynucleotide is known.

35. A kit as claimed in claim 34 wherein the control sample component is selected from the group consisting of liver cancer cells, preneoplastic liver cells, normal liver cells, breast cancer cells, normal breast cells, colon cancer cells, normal colon cells, kidney cancer cells, normal kidney cells, an extract of any of the foregoing cells, a blood sample from a human or non-human animal, and a blood-derived sample from a human or non-human animal.

36. A kit as claimed in claim 34, wherein the control sample component is an isolated polypeptide consisting of an amino acid sequence encoded by the first nucleotide sequence in claim 1, or an isolated nucleic acid consisting of the polynucleotide in claim 1.

37. A kit comprising:

at least one of an antibody that specifically binds to a polypeptide consisting of an amino acid sequence encoded by the first nucleotide sequence in claim 6, and a probe that hybridizes to the polynucleotide in claim 6; and

at least one control sample component for which the relative or absolute amount of the polypeptide or polynucleotide is known.

38. A kit as claimed in claim 37, wherein the control sample component is an isolated polypeptide consisting of an amino acid sequence encoded by the first nucleotide sequence in claim 6, or an isolated nucleic acid consisting of the polynucleotide in claim 6.

39. A kit as claimed in claim 38, wherein the isolated polypeptide is selected from the group consisting of SEQ ID NO:2 and SEQ ID NO:4, and the isolated nucleic acid is selected from the group consisting of nucleotide 25 to nucleotide 1341 of SEQ ID NO:1 and nucleotide 1 to nucleotide 1200 of SEQ ID NO:3.